Section 4.19
Energy

This section discusses current and projected future energy consumption associated with traffic in the study area. Daily energy consumption figures (2001) have been updated based on output from the 2004 WFRC travel demand model (version 3.2). The updated travel demand model was also used to estimate daily energy consumption in 2020 in order to evaluate the potential energy-related environmental impacts of traffic associated with the proposed action.

4.19.1 Approach and Methodology

4.19.1.1 Changes since June 2000 Final EIS

To update the affected environment and environmental consequences information associated with energy in the study area, Sections 3.19 and 4.19 of the Final EIS were reviewed to determine what changes had taken place since publication of the Final EIS. The study area for energy is the North Corridor, which includes all of Salt Lake and Davis Counties. In addition, this section presents energy information for a four-county area, which includes Weber, Davis, Salt Lake, and Utah Counties. The energy impacts were evaluated assuming that the 2020 build scenario would include Legacy Parkway, I-15 reconstruction to 10 lanes, and Maximum Future Transit; to that extent, the transportation system varies from the projected 2020 transportation system in the WFRC long range plan. These differences have been explained more fully in Chapters 1 and 2 of this SEIS

The analysis presented in the Final EIS was based on the 1997 version of the WFRC travel demand model. This model was updated in 2004, and the updated model (version 3.2) has been used to reevaluate the assessment of energy impacts presented in this document.

4.19.1.2 Changes since Draft Supplemental EIS

Changes have been made to the calculations of impacts on energy resources for traffic-related energy consumption since the Draft Supplemental EIS was published in December 2004 because more thorough traffic modeling was conducted that used a single, consistent, and complete version of the WFRC travel model version 3.2 for all scenarios reported. Impact information presented in Table 4.19-1 has been updated to reflect those modifications.

Table 4.19-1 Existing (2001) and Future (2020) Daily Traffic-Related Energy Consumption[3]

	Existing Conditions (2001)			No-Build Alternative (Future Conditions [2020])			Build Alternatives (2020)		
Area	VMT	Energy Consumption (million Btu)	Fuel Consumption (gallons)	VMT	Energy Consumption (million Btu)[1]	Fuel Consumption (gallons)	VMT	Energy Consumption (million Btu)[1]	Fuel Consumption (gallons)
North Corridor	2,550,729	15,942	127,536	3,761,613	17,743	141,948	3,778,607	17,824	142,589
Four-County[2]	39,618,291	247,614	1,980,915	62,277,511	293,762	2,350,095	62,322,666	293,975	2,351,799

Notes:

[1] The slight increase in energy consumption between the 2020 future no-build conditions and 2020 build alternatives in the four-county area is consistent with the increase in energy consumption in the North Corridor between these two conditions. The increase in energy usage would be minimized by providing a more direct route and reducing congestion, thus increasing mobility.

[2] VMT totals for the four-county area include centroid connectors. Centroid connectors represent groups of local streets. The model represents such minor facilities in an aggregate, abstract manner, and mileage accumulated on centroids is an approximation of minor street mileage. VMT totals that include centroid mileage account for all travel, not only on the major highway and arterial networks, but also on the local and collector streets. This mileage, therefore, includes travel between the arterial network and the sites at which the traffic is generated, such as groups of homes or commercial establishments. VMT totals that exclude centroid travel exclude mileage accumulated on the first and last mile, approximately, of each trip.

[3] Energy calculations in the Final Supplemental EIS differ from the Draft Supplemental EIS because a more thorough traffic model was conducted that used a single, consistent, and complete version of WFRC travel model version 3.2 for all scenarios reported.

VMT = vehicle miles traveled; Btu = British thermal unit; 1 gallon gasoline = 125,000 Btu (Oregon State Department of Energy 2003).

Passenger vehicles are assumed to achieve gasoline fuel efficiency of 20 miles per gallon (mpg) in 2001 (U.S. Department of Transportation 2002), and 26.5 mpg in 2020 (U.S. Department of Energy 2003a).

Source: Wasatch Front Regional Council travel demand model (version 3.2), as modified and run by Fehr & Peers.

4.19.2 Affected Environment

As described in the Final EIS, traffic is projected to continue to increase along existing highways and roadways in the study area. Current (2001) vehicle-miles traveled (VMT) in the study area were determined using the 2004 travel demand model (version 3.2), as was VMT for the four-county area described above. The existing traffic demand information and related energy consumption are presented above in Table 4.19-1, which updates Table 3-38 in the Final EIS.

4.19.3 Environmental Consequences and Mitigation Measures

As described in the Final EIS, vehicles using any proposed build alternative would consume energy. If Legacy Parkway is not constructed, however, vehicles using existing facilities will also consume energy. To determine how much future energy consumption could be attributed to vehicles using Legacy Parkway, the 2004 WFRC travel demand model (version 3.2) was used to generate two sets of future (2020) daily energy consumption figures for the study area (i.e., North Corridor) and for the four-county area: one without Legacy Parkway (future no-build conditions), and one with Legacy Parkway.

Construction activities associated with Legacy Parkway would also result in energy consumption; construction impacts are discussed in Section 4.20, *Construction Impacts*. The following provides a summary of potential energy impacts.

4.19.3.1 Direct Impacts

Direct energy impacts are associated with energy that would be consumed by vehicles using the transportation facilities in the study area, including Legacy Parkway if it is constructed. As described in the Final EIS, fuel consumption varies with traffic characteristics. The primary traffic characteristics are traffic flow (average vehicle speed), driver behavior, the geometric configuration of the highway, the vehicle mix, and climate and weather. Of all the traffic-related factors, average vehicle speed accounts for most of the variability in fuel consumption and is a good predictor of fuel economy for most urban travel. Fuel efficiency under steady-flow "cruising" driving conditions peaks at 72 kilometers per hour (kph) (45 miles per hour [mph]) to 97 kph (60 mph), and then rapidly declines as speeds increase. At lower speeds, fuel efficiency is reduced by engine friction, tires, use of powered accessories (e.g., air conditioning), and repeated braking and acceleration (Davis and Diegel 2003).

The VMT in the study area and in the four-county area under the existing (2001) conditions, future no-build conditions (2020), and build alternatives in 2020 were determined using the 2004 WFRC travel demand model (version 3.2) and are presented in Table 4.19-1 above. The build alternatives were not evaluated individually because energy consumption would not vary significantly among them. The energy impacts are summarized below.

No-Build Alternative

Existing Conditions (2001)

No project-related energy impacts would occur under the existing conditions (2001) No-Build Alternative.

Future Conditions (2020)

Under the future conditions (2020) No-Build Alternative, VMT in the study area (i.e., North Corridor) in 2020 is projected to increase approximately 47 percent over 2001 levels, and related energy consumption is projected to increase by approximately 11 percent over the next 20 years (Table 4.19-1). The VMT in the four-county area in 2020 is projected to increase 57 percent over 2001 levels, and related energy consumption by about 19 percent. The fuel efficiency of vehicles is expected to improve by about 33 percent during the same period (e.g., new light-duty vehicle efficiency is projected to reach 26.5 mpg by 2020) (U.S. Department of Energy 2003b). This projected increase in fuel efficiency is included in the energy calculations shown in Table 4.19-1.

As illustrated in Table 4.19-1 under the No-Build Alternative future conditions, vehicles traveling through the study area in 2020 would use slightly less energy and fuel than under the build alternatives. Similarly, vehicles traveling through the four-county area would use slightly less energy and fuel under the future conditions No-Build Alternative than under the build alternatives. The build alternatives would provide increased capacity, which would result in increased VMT and energy consumption. However, this increase in energy usage would be minimized because the build alternatives would provide a more direct route and reduce congestion.

Build Alternatives

The build alternatives would result in increased energy consumption in the study area due to traffic use of the Legacy Parkway facilities. Under the build alternatives, VMT in the study area in 2020 is projected to increase approximately 48 percent over 2001 levels, and related energy consumption is projected to increase by approximately 11 percent over the next 20 years (Table 4.19-1). Under the build alternatives, the VMT in the four-county area in 2020 is projected to increase 57 percent over 2001 levels, and related energy consumption by about 19 percent.

The increases in VMT and energy consumption in both the study area and the four-county area are very similar to those that would be experienced in 2020 if none of the build alternatives were constructed. The difference in daily energy consumption between the future no-build scenario and the proposed build alternatives is a savings of 81 million Btu (0.005 percent), and the difference in daily fuel consumption is a savings of 641 gallons (0.005 percent) (Table 4.19-1). This slightly higher energy usage under the build alternatives would result from the added traffic capacity provided by the build alternatives. However, the difference in energy usage is relatively small because the added traffic capacity of the build alternatives would decrease the energy consumption of individual vehicles by increasing average vehicle speeds and smoothing traffic flows. Although the future no-build scenario results in lower VMT, congestion and stop-and-go traffic would increase the energy usage per VMT in the study area.

Energy consumption in the four-county area would slightly increase under the build alternatives compared to the future conditions No-Build Alternative, as described above and illustrated in Table 4.19-1.